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Survey of United States Uranium Marketing Activity

August 1979

U.S. Department of Energy
Assistant Secretary for Resource Applications
Office of Uranium Resources and Enrichment

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Washington, D.C. 20461

SURVEY OF UNITED STATES URANIUM MARKETING ACTIVITY

Introduction

As part of a continuing assessment of uranium procurement for nuclear power plants in the United States, the Resource Assessment Operations Division, Office of Uranium Resources and Enrichment of the U.S. Department of Energy (DOE) has completed a survey of U.S. uranium marketing and procurement in 1978. Reports on uranium marketing activities have been published since 1968 by the Atomic Energy Commission, the Energy Research and Development Administration, and DOE.

Information for the present survey was received from 61 utilities with nuclear reactor projects, 35 present or potential uranium producers, and 5 reactor manufacturers. The information provided by these respondents provides virtually complete coverage of U.S. uranium marketing activities. The respondents are listed in Attachment A.

The survey requested data on domestic uranium purchase commitments, uranium imports and exports, unfilled requirements, U_3O_8 available for sale by producers, inventories of domestic- and foreign-origin uranium, inventory policies, and prices under existing contracts between domestic primary producers and domestic buyers. Information on actual and planned capital expenditures for uranium production facilities, also gathered in the survey, will be presented in a separate DOE press release to be issued later.

Purchase Commitments of Domestic Uranium by U.S. Buyers

As shown in Table I, U.S. primary producers and U.S. buyers made additional contract commitments during 1978 for 23,000 tons of domestic-origin U_3O_8. These new commitments were offset by a 10,800 ton reduction in January 1, 1978, delivery commitments under previous contracts. The reductions were primarily from revised schedules of utility captive production. Revision of these production schedules had previously been noted in the July 1, 1978, price survey which indicated a net reduction in delivery commitments for the 1978-1985 period.1/

Table II shows reported annual delivery commitments of domestic-origin uranium from domestic primary producers to domestic buyers as of January 1, 1979, and January 1, 1978. Actual deliveries reported for 1978 were 3,300 tons less than expected at the beginning of 1978. This downward revision follows a pattern evidenced in previous years where actual deliveries were less than scheduled at the beginning of the year, and can be attributed to the fact that some deliveries were not made because of litigation and others were delayed because of reactor and fuel cycle rescheduling.

On a cumulative basis through 1983, delivery commitments as of January 1, 1979, are lower than those of January 1, 1978. Commitments increased in 1979 and 1980 due in part to rescheduling of 1978 deliveries. Commitments increased for each year after 1982, since most commitments entered into during 1978 were in contracts for which the period of delivery

1/ G. F. Combs, Jr., and J. A. Patterson, "Uranium Market Activity," GJO-108 (78).

TABLE I

DOMESTIC COMMERCIAL URANIUM DELIVERIES AND COMMITMENTS[1/]
AS OF
JANUARY 1, 1978 AND JANUARY 1, 1979

	Tons U_3O_8
Past Deliveries Plus Forward Commitments (1/1/78)	300,700
Changes During 1978	
Total New Purchases	23,000
Changes to 1/1/78 Commitments[2/]	(10,800)
Net Change	12,200
Past Deliveries Plus Forward Commitments (1/1/79)	312,900
Deliveries:	
Prior to 1978	107,700
During 1978	15,800
Forward Commitments (1/1/79)	189,400

1/ Delivery commitments between domestic producers and buyers; transfers between producers or between buyers are not included.

2/ Primarily the sum of reductions due to nondelivery of material under litigation and revised production schedules for captive production.

TABLE II

URANIUM DELIVERY COMMITMENTS
DOMESTIC PRIMARY SOURCES TO DOMESTIC BUYERS
TONS U_3O_8

Year of Delivery	Annual		Cumulative	
	As of 1/1/78	As of 1/1/79	As of 1/1/78	As of 1/1/79
1966-1977	--	--	107,700	107,700
1978	19,100	15,800	126,800	123,500
1979	17,700	19,100	144,500	142,600
1980	19,600	20,000	164,100	162,600
1981	19,600	19,300	183,700	181,900
1982	19,500	19,400	203,200	201,300
1983	17,000	17,800	220,200	219,100
1984	13,000	14,100	233,200	233,200
1985	11,700	12,800	244,900	246,000
1986	9,100	10,900	254,000	256,900
1987	8,800	10,500	262,800	267,400
1988	7,900	9,500	270,700	276,900
1989	7,500	9,400	278,200	286,300
1990	6,400	7,300	284,600	293,600
1991-2000	16,100	19,300	300,700	312,900

Includes optional quantities - see Table III

Domestic Uranium Commitments to Domestic Buyers

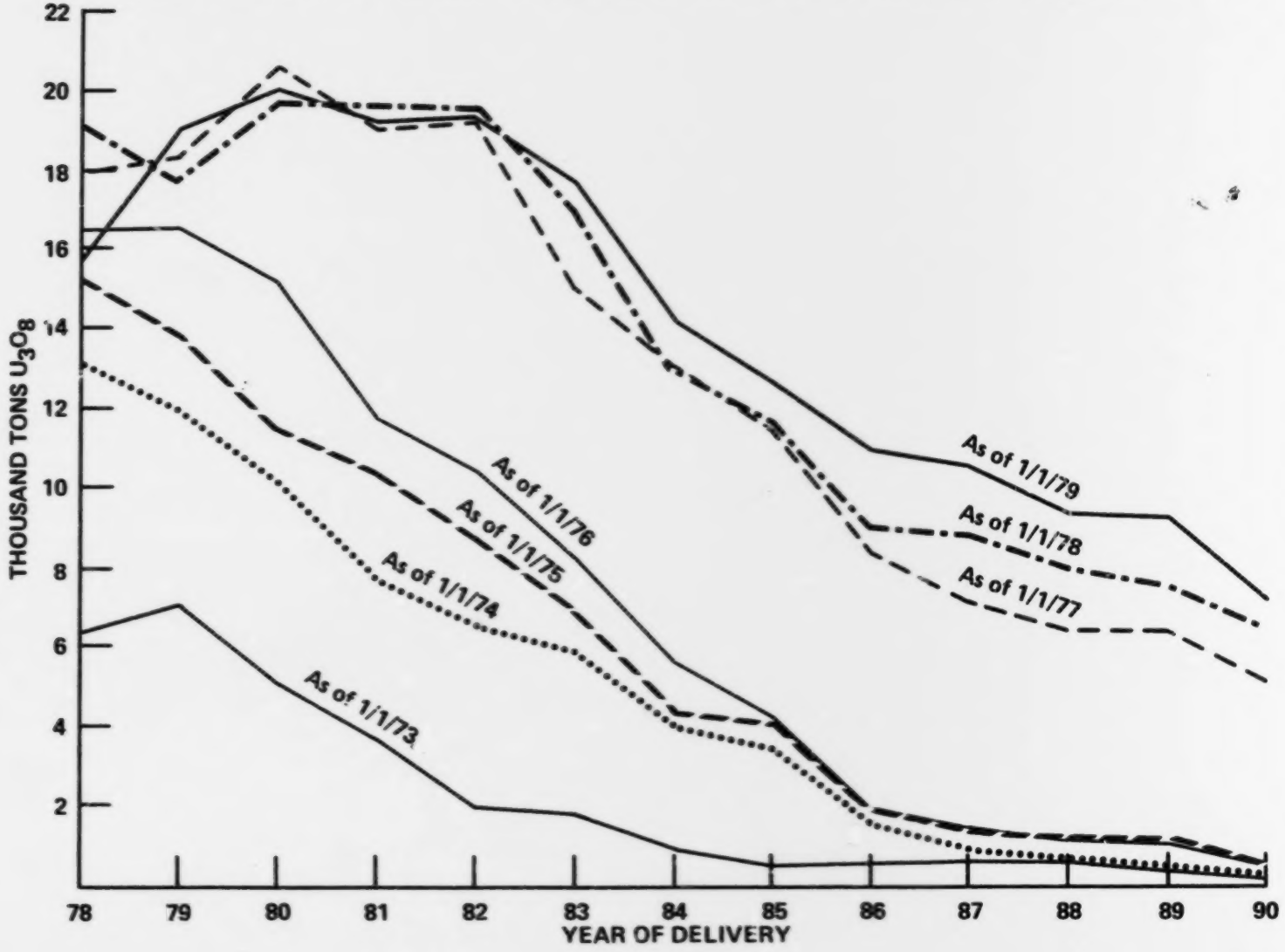


Figure 1

TABLE III

OPTIONAL URANIUM DELIVERIES, DOMESTIC PRIMARY PRODUCERS TO DOMESTIC BUYERS
TONS U_3O_8

Year of Delivery	Annual		Cumulative	
	As of 1/1/78	As of 1/1/79	As of 1/1/78	As of 1/1/79
1979	300	300	300	300
1980	800	700	1,100	1,000
1981	600	400	1,700	1,400
1982	400	500	2,100	1,900
1983	900	700	3,000	2,600
1984	800	1,000	3,800	3,600
1985	600	700	4,400	4,300
1986	600	700	5,000	5,000
1987	600	700	5,600	5,700
1988 on	800	1,900	6,400	7,600

extends past 1982. Figure 1 graphically compares annual delivery commitments for the 1978 to 1990 period reported by domestic producers and buyers as of January 1, 1973, 1974, 1975, 1976, 1977, 1978, and 1979. This graph shows that contract activity in 1978 is similar to 1977, with decreases in delivery commitments for some years in the near term and most additions in the post-1982 period.

Optional Uranium Deliveries

Scheduled optional uranium deliveries as of January 1, 1978, and January 1, 1979, are listed in Table III, which represents a portion of the quantities reported in Table II. Table III shows a minor change between the January 1, 1978, and 1979 surveys in the total options and delivery schedules through 1987, with a net addition in options of 1,200 tons for the post-1987 period.

Uranium Supply Under Litigation

This report includes data on delivery commitments for contracts under litigation unless it appears that the uranium has not been, or will clearly not be, delivered. About 7,000 tons of the commitments listed in Table II are from contracts identified as being under litigation. On the other hand, prices of material under litigation are not included in our data on prices. The practice follows from the fact that disputes are more likely to involve pricing problems than the quantities to be delivered. As litigations involving uranium delivery and price disputes are resolved, the data will be adjusted accordingly.

Uranium Prices

The present survey extends from 1985 to 1988 the period of coverage for average "contract prices" and average floor prices of "market price" contracts. "Contract prices" relate to prices of procurement where price and the means of escalating this price are determined when the contract is signed. In "market price" contracts, prices are determined at or sometime before time of delivery and are based on prevailing prices. Most market price contracts contain floor (or base) prices which provide a lower limit on the eventual settled price. These floor prices and means of escalation are determined when the contract is signed and thus can be reported like contract prices.

Table IV, Column 2, shows the average reported contract prices including prices of settled market price commitments. Market price settlements are included with "contract prices" since, as settled prices, they are similar to "contract prices." This procedure also provides the most comprehensive average price for actual 1978 deliveries. The average 1978 price was $21.60 per pound compared to $18.50 reported as of July 1, 1978[1/] and $17.40 reported as of January 1, 1978[2/].

1/ DOE Release No. R-78-495, "DOE Reports Results of Uranium Price Survey," December 1978.
2/ DOE/RA-0006, "Survey of U.S. Uranium Marketing Activity," May 1978.

TABLE IV

AVERAGE OF CONTRACT PRICES AND SETTLED MARKET PRICE CONTRACTS, AND AVERAGE FLOOR PRICES OF MARKET PRICE CONTRACTS

Year	Average of Contract Prices and Settled Market Price Contracts		Average Floor Prices of Market Price Contracts	
	Price Per Pound of U_3O_8 (Year-of-Delivery Dollars)	Percent of Commitments for Which Prices Were Reported	Price Per Pound of U_3O_8 (Year-of-Delivery Dollars)	Percent of Market Price Commitments with Floor Prices for Which Prices Were Reported
1978	21.60*	86*	--	--
1979	18.95*	92*	39.45	72
1980	20.15*	91*	44.20	64
1981	24.60	87	48.00	69
1982	24.85	85	47.40	64
1983	26.05	83	53.35	67
1984	28.05	86	57.60	63
1985	28.95	34	60.90	64
1986	32.10	74	64.60	63
1987	34.25	75	68.40	63
1988	40.05	71	73.55	72

*Includes price settlements of market price contracts.

DISTRIBUTION OF U_3O_8 PRICES, 1/1/79 CONTRACT PRICES AND MARKET PRICE SETTLEMENTS

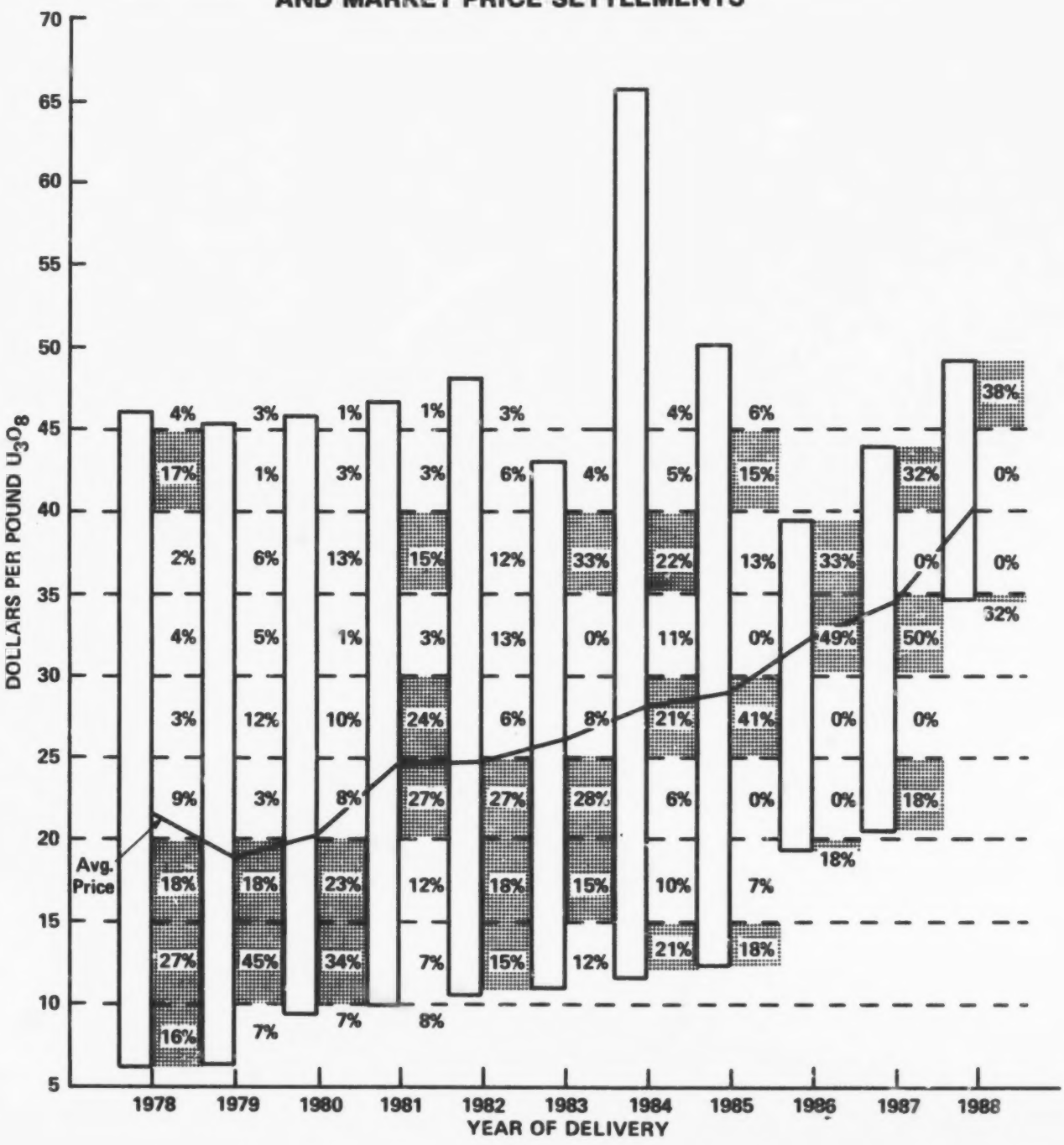
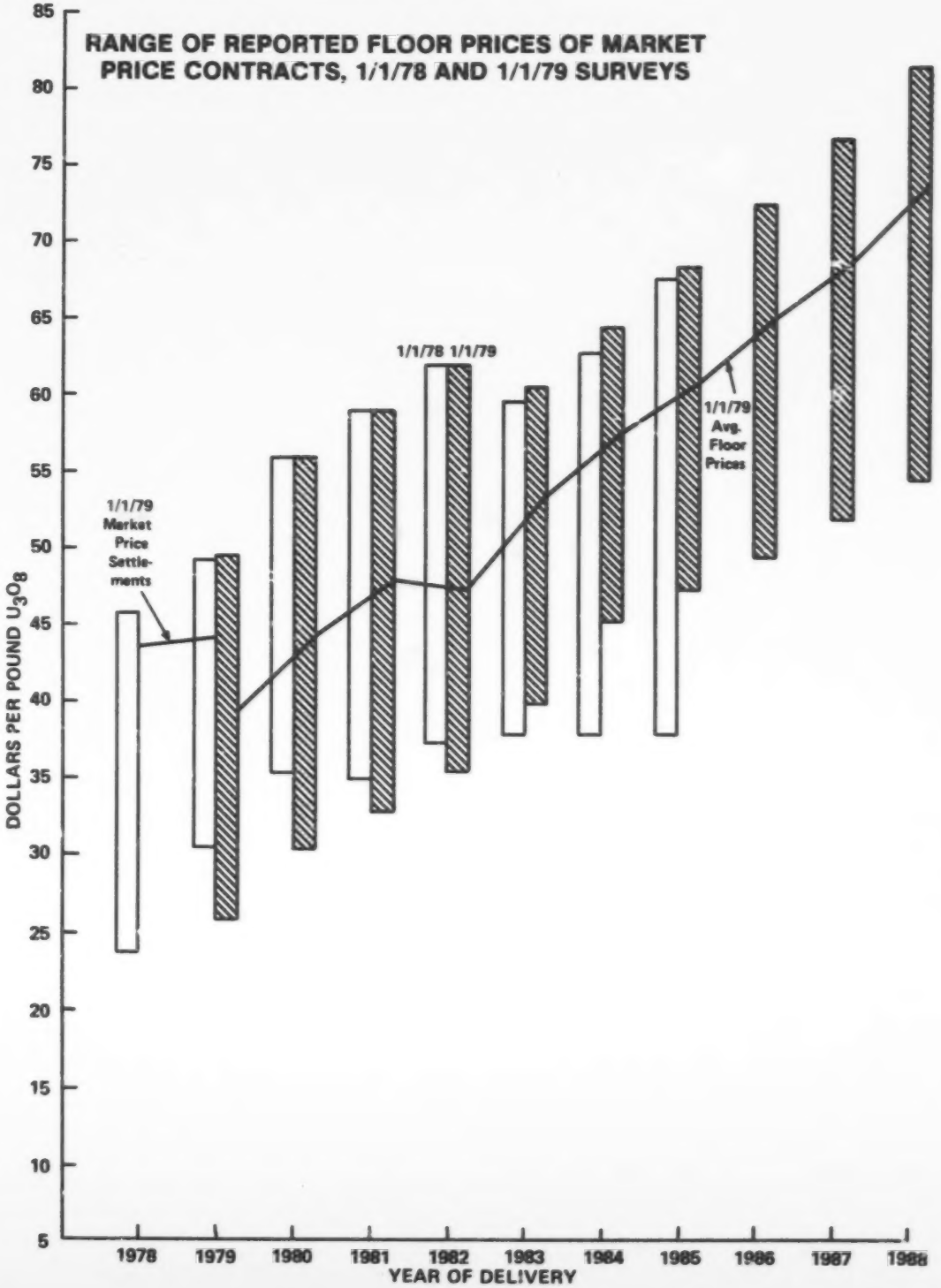


Figure 2

Figure 3


RANGE OF REPORTED FLOOR PRICES OF MARKET PRICE CONTRACTS, 1/1/78 AND 1/1/79 SURVEYS
DOLLARS PER POUND U_3O_8
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
1/1/78 1/1/79
1/1/79 Market Price Settle-ments
1/1/79 Avg. Floor Prices
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
YEAR OF DELIVERY

The average floor prices of market price contracts range from $39.45 in 1979 to $73.55 in 1988 (Table IV, Column 4). These average floor prices are about twice as high as the average contract prices reported in Column 2.

The average prices in Table IV are in terms of year-of-delivery dollars and, as such, reflect buyers' estimates of escalation as appropriate for their contracts. Also shown in Table IV are the percentages of annual commitments or deliveries for which price data were reported. Thus, in 1978 prices were reported for 86 percent of the total of contract price and settled market price deliveries. In general, the percentages of reported prices for contract price and market price settlement deliveries, ranging from 71 to 92 percent, are higher than those for floor prices of market price contracts, 63 to 72 percent. However, in both cases the percentages are sufficiently high for the data to provide a good representation of prices.

Distribution of Prices

Figure 2 depicts, in $5 increments, the annual distribution of contract price commitments (along with settlements of market price contracts) for the 1978-1988 period. Those increments covering 15 percent or more of any year's delivery commitments are shaded. It can be seen that many contract price commitments have delivery prices below $20 per pound, explaining why average prices are lower than current prices for new purchases.

The annual ranges of floor prices for market price contracts as of January 1, 1978, and January 1, 1979, are shown in Figure 3. Price settlements of market price contracts, as well as the January 1, 1979, average floor prices, are shown with the ranges. It should be noted that as these prices are reported in year-of-delivery dollars, changes in the ranges of average prices may reflect changes in expectations of inflation as much as underlying contract trends.

Price Settlements of Market Price Contracts

Table V shows price settlements of market price contracts as of January 1, 1978, July 1, 1978, and January 1, 1979. Typically, prices of all the uranium delivered in the year prior to the survey would have been settled, as well as a portion of the market price commitments for the year in which the survey is taking place. Prices were reported in the current survey for over two-thirds of market price settlements for both 1978 and 1979 deliveries.

A distinction must be made between a "price settlement of a market price contract" and the "market price." For example, the settled price of a market price contract that contains a floor price may be the floor price and not the market price, if the market price were below the floor price. For the purpose of our survey, we consider a market price contract one where price is based on, but not necessarily equal to, the prevailing market price. Thus, market price must be determined before settling the price of a market price contract even though the settled

TABLE V

PRICE SETTLEMENTS OF MARKET PRICE CONTRACTS
(YEAR-OF-DELIVERY DOLLARS)

Year of Delivery	As of 1/1/78		As of 7/1/78		As of 1/1/79	
	Average Price ($/lb U_3O_8)	Tons U_3O_8	Average Price ($/lb U_3O_8)	Tons U_3O_8	Average Price ($/lb U_3O_8)	Tons U_3O_8
1977	$41.50	800	-	-	-	-
1978	$43.95	1,100	$43.65	1,400	$43.80	1,700
1979	-	-	$44.65	600	$44.30	600

price might be some other value, such as a previously determined floor price or some variation based on a formula or arrangement in the contract.

To determine the extent to which the settled prices varied from market prices (which must also be "agreed to") in market price contracts, we asked the survey respondents to report both, where appropriate. In one case, the settled price was greater than the market price.

Comparison of the price settlements of market price contracts as reported in different surveys shown in Table V indicates that there have been some declines in price in both absolute and real terms since January 1, 1978. While the 1978 price as of January 1, 1979, is greater than that as of July 1, 1978, it is less than the 1978 price as of January 1, 1978. In addition, the differential in the two prices reported as of each survey has been decreasing. Since these market price settlements are reported in year-of-delivery dollars, the high inflation in 1978 and anticipated high rate in 1979 must be considered in determining the real price trends. Note that the 1979 price declined while the tons remained the same. This situation is due to a different mix of contracts reflected in the 600 tons. That is, the amount to be delivered as of July 1, 1978, decreased and there was an additional contract settlement offsetting the decrease.

Procurement Arrangements and Trends

Table VI presents the distribution, by year-of-delivery, of types of uranium procurement--contract price, market price, and "other." Contract price and market price procurement have already been described. In reporting prices, settled market price contracts are included with contract price commitments, but in presenting the distribution of procurement type they are included in the market price category. The "Other" procurement category refers to arrangements that fall outside the contract price or market price categories. It primarily involves cases where utilities directly control uranium production (captive production). About 80 percent of the "Other" arrangements is captive production.

As shown in Table VI the percentage of contract price procurement steadily declines from a high of 82 percent in 1978 to a low of 16 percent in 1988, while the percentage of "Other" procurement, which was very low in 1978 (3 percent), steadily increases during this period to 47 percent. Market price procurement increases from 15 percent in 1978 to 34 percent in 1981, then remains at about that level through 1988. Since more delivery commitments have been made for those earlier years where the percentage of contract price procurement is high, contract price procurement remains the dominant form of contracting for the 1978-1988 period as of January 1, 1979. Note that these percentages apply only to existing delivery commitments and will change as more uranium is procured for delivery in this period.

TABLE VI

TYPE OF URANIUM PROCUREMENT AS OF JANUARY 1, 1979

YEAR OF DELIVERY	PERCENTAGE OF DELIVERIES BY TYPES OF PROCUREMENT		
	CONTRACT PRICE	MARKET PRICE	OTHER
1978	82	15	3
1979	81	13	6
1980	73	18	9
1981	52	34	14
1982	46	35	19
1983	40	34	26
1984	34	33	33
1985	32	30	38
1986	16	39	45
1987	17	37	46
1988	16	37	47
1978-1988	49	28	23

TABLE VII

FLOOR PRICE ARRANGEMENTS IN
MARKET PRICE CONTRACTS
AS OF JANUARY 1, 1979

Year of Delivery	Percentage of Market Price Deliveries		
	Price Base	Cost Base	No Base Value
1979	42	31	27
1980	59	24	17
1981	56	17	27
1982	46	20	34
1983	28	33	39
1984	35	47	18
1985	43	47	10
1986	37	48	15
1987	43	40	17
1988	34	39	27
1979-1988	42	33	25

Contract price procurement was used almost exclusively until 1975 when market price contracting became the major approach. In 1976 "Other" procurement, primarily captive production, dominated. During 1977, slightly over half of the uranium purchased was market price procurement, with the remainder contract price procurement (about half of which involved 1977 and 1978 deliveries). In 1978 market price procurement was again dominant, accounting for 70 percent of new procurement, with 20 percent coming under the "Other" category.

Table VII presents a more detailed breakdown on the use of floor prices in market price contracts. In the table, market price contracts have been divided into three categories: (1) those with specific floor prices, (2) those where the floor price is related to production costs, and (3) those with no floor price provision. Some 75 percent of the market price commitments for the 1979-1988 period do have some provision for floor price in the contract. About 15 percent of those without any floor price provision are options.

Uranium Raw Materials Activities by Utilities

Of 61 utilities with nuclear power projects responding to this survey, 26 (43 percent) indicated that they are directly involved in uranium raw materials activities. Such raw materials activities by utilities would include exploration, ownership of reserves, involvement in mine development, and production. Providing "front-end" money as part of a procurement agreement would not constitute direct involvement by a utility. Types of activities and frequency listed were as follows: exploration (23 companies), control of reserves (11), mining (7), and production (2). Note that a utility can be engaged in more than one activity.

Uranium Import Commitments

During 1978 domestic buyers contracted to purchase an additional 1,500 tons of foreign-origin U_3O_8 (including options). The delivery schedule for purchase commitments of foreign-origin uranium as well as historical deliveries is shown in Table VIII. These data do not include resales of foreign-origin uranium by U.S. companies. The current schedule of purchase commitments reflects modifications to the January 1, 1978, schedule due to resolution of litigation, dropping of options, and re-export of foreign-origin uranium.

Uranium Export Commitments of Domestic-Origin Uranium

Table IX shows annual delivery schedules for export commitments of domestic-origin uranium from domestic primary producers to foreign buyers as of January 1, 1979. During 1978 additional export contracts totalling 5500 tons were made, more than double the 2,600 tons contracted for during 1977. The relatively large export commitments made by U.S. producers during 1978 can be attributed to the decline in the value of the U.S. dollar against certain foreign currencies, and the ability of domestic producers to make spot or short-term foreign sales because U.S. buyers were not very active in the short-term market.

TABLE VIII

FOREIGN-ORIGIN URANIUM PURCHASE COMMITMENTS
FOR DOMESTIC END USE

Tons of U_3O_8
As of January 1, 1979

Year of Delivery	Annual	Cumulative
1975	700	700
1976	1,800	2,500
1977	2,800	5,300
1978	2,600	7,900
1979	1,700	9,600
1980	1,700	11,300
1981	4,000	15,300
1982	3,600	18,900
1983	3,300	22,200
1984	3,300	25,500
1985	3,400	28,900
1986-1990	1,750/yr	37,600

Includes 1,500 tons of optional purchases.

TABLE IX

SALES COMMITMENTS OF DOMESTIC-ORIGIN
URANIUM TO FOREIGN BUYERS
TONS OF U_3O_8
AS OF JANUARY 1, 1979

YEAR OF DELIVERY	ANNUAL	CUMULATIVE
1966	400	400
1967	700	1,100
1968	800	1,900
1969	500	2,400
1970	2,100	4,500
1971	200	4,700
1972	100	4,800
1973	600	5,400
1974	1,500	6,900
1975	500	7,400
1976	600	8,000
1977	2,000	10,000
1978	3,400	13,400
1979	2,600	16,000
1980	1,600	17,600
1981	800	18,400
1982	500	18,900
1983	500	19,400
1984	400	19,800
1985	400	20,200
1986-1989	800	21,000

Uranium Imports and Exports: Trends and Future Balance

A comparison of Tables VIII and IX shows that U.S. buyers have larger future (1979 on) uranium import commitments (29,700 tons) than U.S. producers have export commitments (7,600 tons). However, this difference is not very great (less than the current inventory) and must be viewed in light of the following factors. First, new U.S. export commitments have exceeded new import commitments over the past 3 years because of expanded U.S. supply and delayed demand. Actual exports exceeded imports in 1978 and are scheduled to do so in 1979. Second, while domestic import commitments have tended to involve long term contracts, U.S. export commitments are basically sales for the near term, so their future level will depend mainly on the future spot market. Third, the projected U.S. uranium supply-demand balance through the mid-1980's suggests that the U.S. can produce more than enough uranium to meet its own demands for some time. Thus, the U.S. will not necessarily be a net importer of uranium, at least through the 1980's; the future uranium import-export balance will depend on the relative competitiveness of foreign versus domestic U_3O_8.

U_3O_8 To Be Available for Sale

Last year's survey sought, for the first time, to ascertain the domestic uranium potentially available for sale by requesting each producer to state "the amount of U_3O_8 supply over and above its current sales commitments" that the "company estimates it would be able to offer for sale" each year up to and including 1985. This year's survey requested the same information. The total sums of the responses for both surveys are presented in Table X.

Sixteen of the producers responding to this question estimated that they would have available an additional 43,300 tons U_3O_8 through 1985. Two producers also indicated that they might have unspecified amounts of additional uranium available for sale above their current commitments in the 1980-1985 period. Four producers expect to have no additional uranium available in this period, while the remaining producers provided indefinite information or no data on this question.

A comparison of the two sets of responses shows a notable reduction in the totals since January 1, 1978. There are two reasons for this reduction. First, two producers who participated in the 1978 survey and reported having 4,000 tons of U_3O_8 available for sale through 1985 did not answer this question in the 1979 survey. Second, twelve producers who responded to both the 1978 and 1979 surveys now plan to have sharply reduced amounts of uranium available for sale through 1985. A reason for these revisions in their estimates relates to the fact that future demand does not appear to be as high now as it did in the beginning of 1978.

Inventories

As uranium inventories could possibly play a larger role in the uranium market over the next several years, this year's survey requested more

TABLE X

U_3O_8 OVER AND ABOVE CURRENT SALES COMMITMENTS
THAT PRODUCING COMPANIES ESTIMATE THEY
WILL BE ABLE TO OFFER FOR SALE
AS OF 1/1/78 AND 1/1/79

YEAR OF DELIVERY	Tons U_3O_8 1/1/78	1/1/79
1979	4,100	1,400
1980	5,000	2,200
1981	8,200	4,000
1982	10,500	6,700
1983	14,000	8,400
1984	16,300	10,100
1985	16,900	10,500
TOTAL	78,100	43,300

information on inventories, both as to their extent and utilities' policies regarding them. The survey requested data on inventories of enriched uranium since the operation of many reactors has been delayed, resulting in a buildup of enriched uranium inventories in the hands of utilities.

Total (normal and enriched) uranium inventories held by U.S. companies (utilities, reactor manufacturers, and producers) were 44,700 tons equivalent U_3O_8 as of January 1, 1979. The level of normal uranium held by these buyers increased during 1978 (Figure 4) from 28,700 to 33,200 tons U_3O_8. Inventories of domestic-origin normal uranium increased by 2,900 tons from the January 1, 1978, level to 28,000 tons U_3O_8, and inventories of foreign-origin U_3O_8 increased 1,600 tons to 5,200 tons U_3O_8.

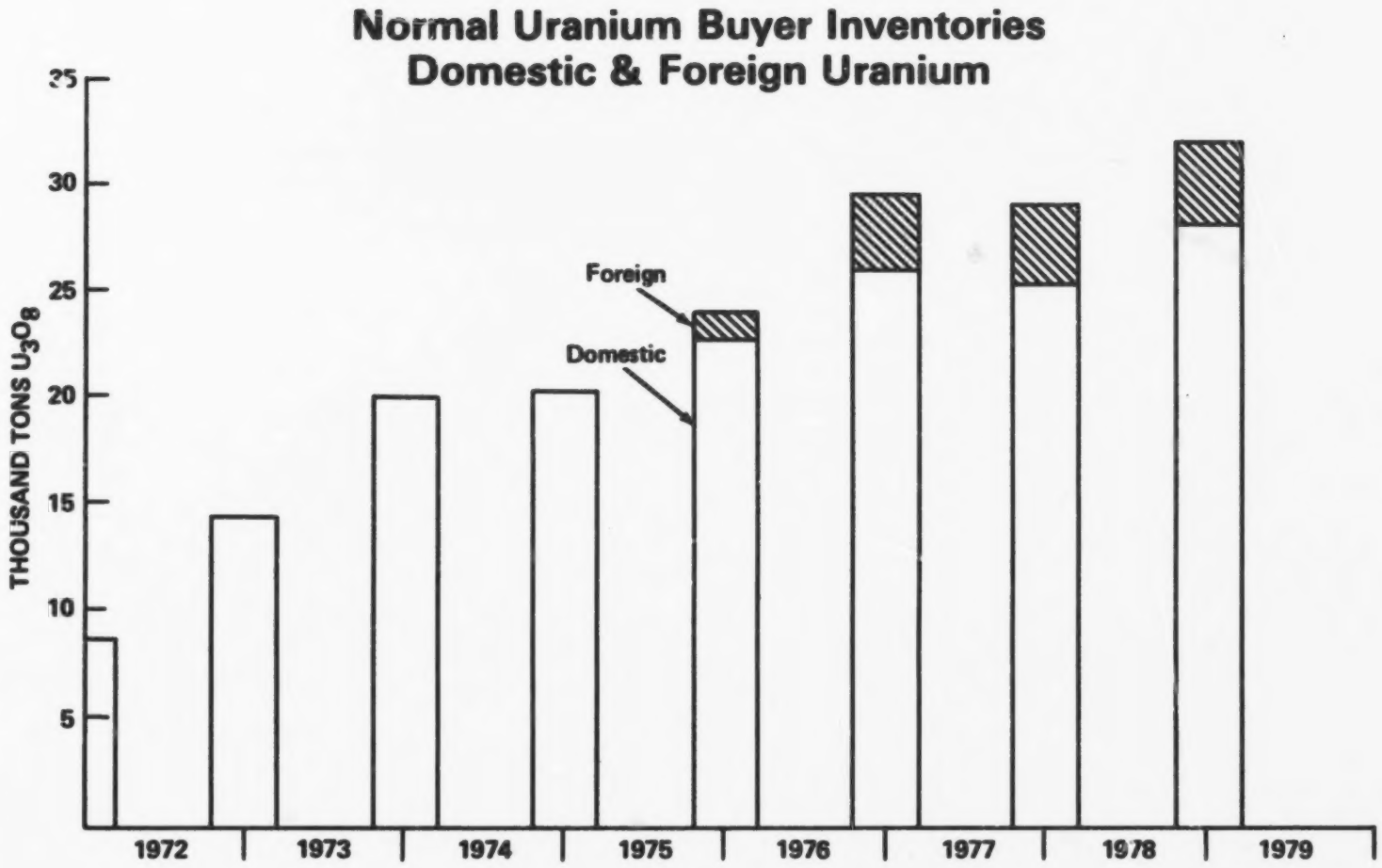
In addition to the inventory of normal uranium, U.S. buyers held 11,500 tons equivalent U_3O_8 of enriched uraniun in inventory, most (11,300 tons) of domestic origin. The small amount of foreign-origin enriched uranium held by buyers reflects the restriction on the enrichment of foreign-origin uranium for use in domestic reactors. In 1978 each customer was allowed to enrich foreign-origin uranium up to 15 percent of its requirements, in 1977 the limit was 10 percent and prior to 1977 it was zero.

Of the 61 utilities with nuclear power projects responding to the survey, 47 reported holding inventories of normal uranium (25,600 tons U_3O_8 of the total normal uranium inventory), compared with 49 utilities holding 21,500 tons as of January 1, 1978, and 41 utilities holding 20,500 tons as of January 1, 1977. The ten utilities with the largest inventories held 56 percent of the 25,600 tons, compared with 56 percent and 70 percent owned by the ten largest holders as of January 1, 1978, and January 1, 1977, respectively.

With respect to inventory policy, utilities were asked if they considered their present inventory level (both normal and enriched) excessive, about right, or less than desirable. They also were questioned as to what level of inventory they would like to hold, expressed in terms of months of future requirements or some similar measure.

Of 61 utilities responding to the survey, 49 responded to the question. Ten companies indicated they had no formal policy, have not established a policy, or have been unable to establish a policy. The remaining 39 utilities provided information on their policies. Regarding their present inventories, 20 felt they were about right, 5 felt they were low, and 10 felt they were excessive. Of the utilities indicating a desirable inventory level, 16 out of 21 responding in terms of forward months or years of supply indicated that they would like to have up to 1 year's supply in inventory. The data obtained on these questions are shown in Table XI.

Inventories held by eighteen domestic primary uranium producers as of January 1, 1979, total about 1,400 tons U_3O_8, a decrease of 1,100 tons from the level reported at the beginning of 1978. Not all producers


Normal Uranium Buyer Inventories
Domestic & Foreign Uranium
THOUSAND TONS U_3O_8
35
30
25
20
15
10
5
Foreign
Domestic
1972
1973
1974
1975
1976
1977
1978
1979

21

Figure 4

TABLE XI

UTILITY VIEWS ON URANIUM INVENTORIES

		Present Inventory Levels				
		Less Than Desirable	About Right	Excessive	Did Not State	Total
Desired Inventory Year's Needs	0	0	0	1	0	1
	>0-1	2	6	4	3	15
	>1-2	1	2	1	1	5
	Did Not State	2	12	4	-	18
	Total	5	20	10	4	39

responded to this question, so the net decrease is probably not as large as 1,100 tons, but there should be a net decrease given deliveries to domestic and foreign customers, and the level of 1978 production. The largest six inventories constituted about 83 percent of the total.

Unfilled Requirements

Table XII lists the sum of unfilled uranium requirements for reactors reported by buyers in the surveys of January 1, 1979, and January 1, 1978. Unfilled requirements are that portion of utilities' total requirements remaining after consideration of their inventories and procurement arrangements.

It is evident that there has been a sizable reduction in the amount of unfilled requirements reported between January 1, 1978, and January 1, 1979. The increase in new procurement accounts for some of this decrease, but most of it is attributable to a reduction in demand in the 1979-1990 period due to adjustment of reactor and enrichment contract schedules. Note that unfilled demand for this period may decrease further as some utilities did not reflect their anticipated demand adjustments in their responses.

Aggregate Supply and Demand

By combining the various data presented above, an aggregate picture of U.S. uranium supply can be developed. Table XIII recaps data from the survey in Columns 1 through 5. The computed total of potential U.S. producer deliveries is shown in Column (6), which includes sales to (1) domestic and (2) foreign buyers, and (3) additional U_3O_8 to be available for sale.

Apparent availability of uranium to U.S. buyers is shown in Column (7) by summarizing domestic purchase commitments of (1) domestic and (4) foreign uranium, and (3) additional domestic U_3O_8 to be available for sale. This supply would be augmented by the 44,700 tons of buyer inventories.

Apparent buyer uranium requirements, Column 8, is obtained by summing purchase commitments--(1) domestic and (4) foreign--and (5) unfilled requirements. These requirements do not reflect the 44,700 tons of inventories that buyers considered as supply in their calculations of unfilled demand. Including inventory use in the table would increase the absolute levels of supply and requirements but would not change the difference between them. Total domestic production (Column 6) exceeds apparent buyer requirements (Column 8) each year up to 1985. However, this relationship only holds if U.S. producers sell all of their estimated additional uranium supply to U.S. buyers.

TABLE XII

UNFILLED URANIUM REQUIREMENTS[1/]
AS REPORTED 1/1/78 AND 1/1/79

Tons U_3O_8

	As of 1/1/78		As of 1/1/79	
	Annual	Cumulative	Annual	Cumulative
1979	1,600	1,600	400	400
1980	3,000	4,600	1,100	1,500
1981	5,700	10,300	3,300	4,800
1982	8,600	18,900	4,200	9,000
1983	8,000	26,900	5,600	14,600
1984	12,400	39,300	9,500	24,100
1985	14,100	53,400	12,000	36,100
1986	19,500	72,900	14,900	51,000
1987	23,300	96,200	17,000	68,000
1988	24,700	120,900	20,300	88,300
1989	28,100	149,000	23,700	112,000
1990	28,600	177,600	23,500	135,500

1/ Assuming tails assays of 0.20 percent, no recycle.

TABLE XIII

U.S. URANIUM SUPPLY AND MARKET SUMMARY

Years	(1) Sales Commitments To Domestic Buyers	(2) Sales Commitments To Foreign Buyers	(3) Estimated U_3O_8 To Be Available for Sale	(4) Procurement of Foreign Uranium	(5) Reported Unfilled Requirements	(6) Total Domestic Production 1+2+3	(7) Total* Domestic Supply 1+3+4	(8) Apparent* Buyer Requirements 1+4+5
1979	19,100	2,600	1,400	1,700	400	23,100	22,200	21,200
1980	20,000	1,600	2,200	1.700	1,100	23,800	23,900	22,800
1981	19,300	800	4,000	4,000	3,300	24,100	27,300	26,600
1982	19,400	500	6,700	3,600	4,200	26,600	29,700	27,200
1983	17,800	500	8,400	3,300	5,600	26,700	29,500	26,700
1984	14,100	400	10,100	3,300	9,500	24,600	27,500	26,900
1985	12,800	450	10,500	3,400	12,000	23,750	26,700	28,200
1986	10,900	250		1,750	14,900			27,550
1987	10,500	250		1,750	17,000			29,250
1988	9,500	250		1,750	20,300			31,550
1989	9,400			1,750	23,700			34,850
1990	7,300			1,750	23,500			32,550

*Buyers have an additional 44,700 tons U_3O_8 in inventory.

Several additional points should be noted when examining Table XIII. First, the annual sales commitments to buyers from domestic and foreign sources do not necessarily represent the amounts that will be used in those years. This situation is especially true with respect to purchase commitments of foreign uranium, since there is a limit to the amount of foreign uranium which can be enriched for domestic use through 1983. Also, scheduled deliveries from domestic sources will exceed demands for the next few years. Thus, there will be a buildup of inventories above the current level for the next several years.

Other factors to consider when interpreting Table XIII are that the numbers in columns 3 and 5 are incomplete and are subject to change. For instance, not all producers provided estimates as to their U_3O_8 available for sale, and those that did respond tempered their responses according to current market conditions. Also, respondents' perceptions of supply under litigation would affect the data in columns 3 and 5 and totals in columns 6, 7, and 8. If a producer felt he did not have to supply a contract in litigation and included this amount in material available for sale, the totals in columns 6 and 7 would be distorted.

Summary

U.S. uranium marketing activity in 1978 was greater than in 1977, but 1978 procurement was far below the record 1976 level. Export commitments increased significantly and were much higher than new import commitments. Most of the purchase commitments by U.S. buyers are still made with U.S. suppliers. Buyer inventories of normal uranium increased a few thousand tons during the year, and there is an enriched uranium inventory of 11,500 tons equivalent U_3O_8.

The average price reported for 1979 deliveries was $21.60 per pound of U_3O_8 compared to the $18.50 estimate reported as of July 1, 1978. An average of $17.40 was reported for 1978. Settlements of market prices average $43.80 in 1978 and $44.30 in 1979. Most market price contracts have a floor price that generally is close to that of market price settlements. Additional quantities of uranium producers expect to offer for sale in the 1979-1985 period are lower than those estimated in the 1978 survey. Unfilled requirements reported by buyers are also reduced from their 1978 amounts. Buyers' responses to the survey suggest that there apparently is an adequate supply of uranium to meet U.S. demand at least through 1985.

Attachment A

COMPANIES PROVIDING DATA TO THE 1979 DOE URANIUM MARKETING SURVEY

Utilities

Alabama Power Company
American Electric Power Company
Arizona Public Service Company
Arkansas Power and Light Company
Baltimore Gas and Electric Company
Boston Edison Company
Carolina Power and Light Company
Cincinnati Gas and Electric Company
Cleveland Electric Illuminating Company
Commonwealth Edison Company
Consolidated Edison Company of New York, Inc.
Consumers Power Company
Duke Power Company
Duquesne Light Company
Florida Power Corporation
Florida Power and Light Company
General Public Utilities Corporation
Georgia Power Company
Gulf States Utilities Company
Houston Lighting and Power Company
Illinois Power Company
Iowa Electric and Power Company
Kansas Gas and Electric Company
Long Island Lighting Company
Louisiana Power and Light Company
Maine Yankee Atomic Power Company
Mississippi Power and Light Company
Nebraska Public Power District
New England Power Company
New York Electric and Gas Company
Niagara Mohawk Power Corporation
Northeast Utilities Service Company
Northern Indiana Public Service Company
Northern States Power Company
Ohio Edison Company
Omaha Public Power District
Pacific Gas and Electric Company
Pennsylvania Power and Light Company
Philadelphia Electric Company
Portland General Electric Company
Power Authority of the State of New York
Public Service Company of Colorado
Public Service Electric and Gas Company
Public Service Company of Indiana
Public Service Company of New Hampshire
Public Service Company of Oklahoma
Puget Sound Power and Light Company

Utilities (continued)

Rochester Gas and Electric Corporation
Sacramento Municipal Utility District
Southern California Edison Company
South Carolina Electric and Gas Company
Tennessee Valley Authority
Texas Utilities Services, Inc.
Toledo Edison Company
Union Electric Company
Vermont Yankee Nuclear Power Corporation
Virginia Electric and Power Company
Washington Public Power Supply System
Wisconsin Electric Power Company
Wisconsin Public Service Corporation
Yankee Atomic Electric Company

Reactor Manufacturers

Babcock and Wilcox Company
Combustion Engineering, Inc.
General Atomic Company
General Electric Company
Westinghouse Electric Corporation

Uranium Producing Companies

Anaconda Company
Atlas Corporation
Becker Industries
Bokum Resources
Chevron Oil Company
Cleveland Cliffs Iron Company
Continental Oil Company
Exxon Nuclear Company, Inc.
Freeport Uranium Recovery Company
Gardinier, Inc.
Getty Oil Company
Gulf Mineral Resources Company
Homestake Mining Company
Inexco Oil Company
Intercontinental Energy Corporation
International Minerals and Chemical Corporation
Kerr-McGee Corporation
Minerals Exploration Company
Minerals Recovery Corporation
Mobil Oil Corporation
Newmont Mining Corporation
Nuclear Dynamics
Pathfinder Mines Corporation
Phillips Petroleum Company
Pioneer Nuclear, Inc.
Ranchers Exploration and Development Corporation

Uranium Producing Companies (continued)

Reserve Oil and Minerals Corporation
Rio Algom Limited
Rocky Mountain Energy Company
Sabine Production Company
Solution Engineering
U.S. Steel Corporation
Union Carbide Corporation
United Nuclear Corporation
Western Nuclear, Inc.